CLAIMS

What is claimed is:

1. A permanent magnet motor comprising:

a stator having a stator coil; and

a rotor, having a plurality of axially bored magnet slots, provided in an amount for the number of poles in the rotor iron core, permanent magnets being fixed into the magnet slots so that neighboring magnetic poles are opposites; wherein

in the rotor, the outer peripheral shape of rotor magnetic-pole portions, formed along each magnetic-pole face on the outer peripheral side of the permanent magnets, is formed so that, in a circumferentially central portion thereof, the distance from the center of the rotor iron core is longest, and, at the inter-polar space between a first of the permanent magnets and a second of the permanent magnets, the distance from the center of the rotor iron core is shortest, and so that the outermost surface of rotor magnetic-pole portions forms an arc, the radially outer side of each magnet slot substantially matching the arc, and being bored in an approximate bow shape; and

given that sheath thickness *tc* formed by the outer-side surface of each permanent magnet and the outermost surface of each rotor magnetic-pole portion is substantially constant, and letting the thickness of each permanent magnet be the magnet thickness *tm*, then the relation $tc/tm \leq 0.25$ is satisfied.

2. A permanent magnet motor according to claim 1, wherein the permanent magnet motor satisfies the relation $0.143 \leq tc/tm \leq 0.174$.

3. A permanent magnet motor according to claim 1 or 2, wherein, given that the diameter where the outer-side surface of the rotor is furthest from the center of the rotor iron core is the rotor maximum diameter *Dr*, and the radius of each arc formed by the outer-side surface of each of the rotor magnetic-pole portions is the rotor arc radius *Rp*, then the permanent magnet motor satisfies the relation $0.23 \leq Rp/Dr \leq 0.32$.

4. A permanent magnet motor according to any of claims 1-3, wherein, given that the width of each of the magnet slots, corresponding to the thickness of each of the permanent magnets, is the slot width *th*, and with both ends of each of the magnet slots being provided with a substantially semi-circular surface, the radius of the semi-circular surface is the slot-end radius *Rh*, then the permanent magnet motor satisfies the relation $0.45 \leq Rh/th \leq 0.5$.

5. A permanent magnet motor according to any of claims 1-4, wherein the number of poles in the rotor is $2n$, and the number of salient poles in the stator is $3n$, where n is a positive integer larger than zero.